

# Getting Started with Data Visualization: Tools for Research!



Alison Blaine / Jennifer Garrett



# Data Visualization Services

[lib.ncsu.edu/do/visualization](http://lib.ncsu.edu/do/visualization)



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## NEED HELP?

> Ask a question or  
request a consultation



Alison Blaine



Karen Ciccone



## Visualization

A good data visualization can expose new patterns and relationships in your data and help you communicate about it more clearly. We can help you:

- > use visualization spaces and technologies
- > use GIS and online mapping software
- > learn how to create more effective data visualizations
- > visualize research impact

## Visualization Spaces

The Libraries provides spaces and technologies for high-resolution, immersive, 3D, and interactive displays of research data. We provide [boilerplate facilities descriptions](#) for inclusion in grant proposals. [Contact us](#) for more information and assistance.

## WORKSHOPS

JAN  
15

Getting Started with Data  
Visualization: Tools for  
Research!  
11:00 AM to 12:00 PM

JAN  
15

Creative Coding Group  
12:15 PM to 1:15 PM

JAN  
27

Visualize Your Data with  
Tableau  
3:00 PM to 4:00 PM

JAN  
29

Data Cleaning and  
Analysis Tips and Tools:  
Excel and Open Refine  
11:00 AM to 12:00 PM

[View all workshops >](#)

# Goals

You should leave with:

- an understanding of various tools for doing visualization
- an understanding of the process for making good visualizations
- practice with two tools

If you have questions, please raise your hand!

# Data Visualization Process

- getting data
- getting to know the data
- setting goals
- determining if a visualization is needed
- deciding what to visualize
- cleaning
- visualizing
- designing (potentially re-visualizing it with a different tool)
- exporting/embedding

# Tools for Getting Started

[Plotly](#)

[Tableau Public](#)

[Raw](#)

[Google Fusion Tables](#)

[CartoDB \(for maps\)](#)

[Voyant \(for text\)](#)

[Here's a curated list](#)

Today's workshop materials

[go.ncsu.edu/startviz](https://go.ncsu.edu/startviz)

# Activity

Step 1: Getting data.

Now, we will go ahead and download the data.

Go to: [go.ncsu.edu/startviz](https://go.ncsu.edu/startviz)

Download the **TopBabyNames.csv** file to your computer

# Step 2: Getting to know the data

## Observe:

- What it's about
  - What is being measured?
  - What don't you know?
- Organization
  - Are columns and rows organized neatly and uniformly?
  - Does each cell have one value?
- Data types
  - What types of data are there? Dates, text, numeric?
  - Do any of those types need to be changed?

## Classify the data:

- change over time
- measurements of different categories (Ex: population rate per county)
- geospatial
- hierarchical (categories and subcategories)

A	B	C	D	E
State	Gender	Year	Top Name	Occurences
AK	F	1910	Mary	14
AK	F	1911	Mary	12
AK	F	1912	Mary	9
AK	F	1913	Mary	21
AK	F	1914	Mary	22
AK	F	1915	Mary	23
AK	F	1916	Mary	18
AK	F	1917	Mary	21
AK	F	1918	Mary	27
AK	F	1919	Mary	22
AK	F	1920	Mary	38
AK	F	1921	Mary	36



# Step 3: Determine your goal



A word cloud of various goals for data visualization, arranged in a roughly circular pattern. The words are of different sizes and orientations, creating a dynamic visual effect. The goals include:

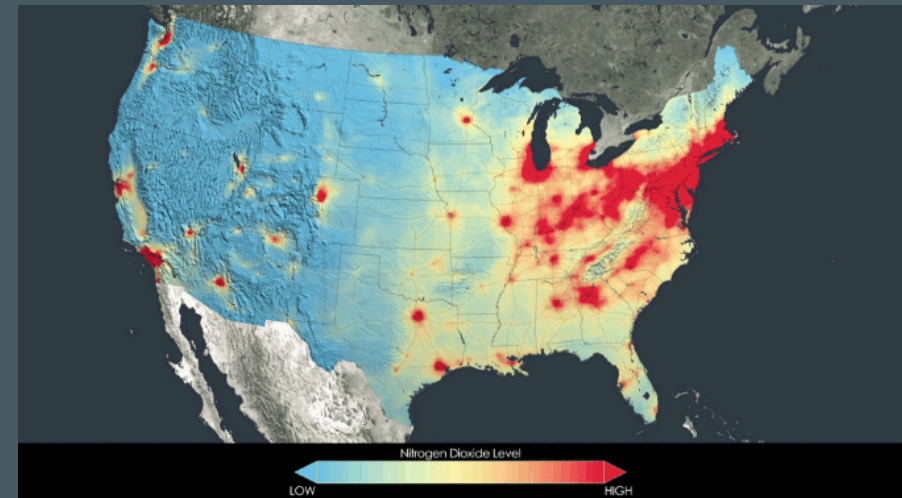
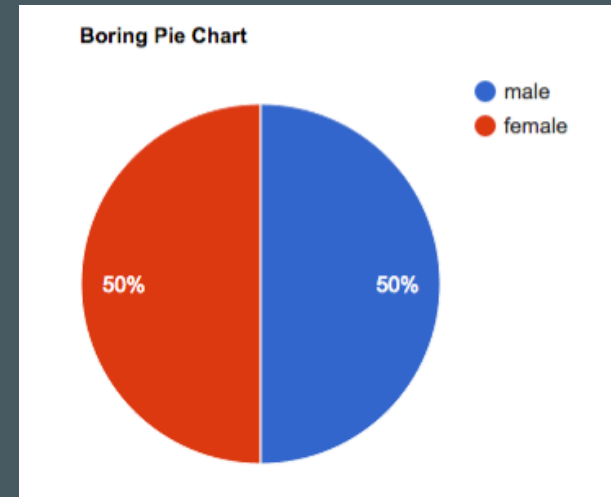
- Lookup
- Persuade
- Creative technique
- Learn/Increase knowledge
- Answer questions
- Change behaviour
- Conduct analysis
- Monitor signals
- Play with data
- Tell story
- Trigger questions
- Enlighten
- Contextualise data
- Find patterns/no patterns
- Serendipitous discoveries
- Familiarise with data
- Shape opinion
- Emphasize issues
- Inspire
- Present arguments
- Grab attention
- Assist decisions
- Experimentation
- Art/Aesthetic pleasure
- Shock/Make an impact

Source: Andy Kirk (2012). *Data Visualization: A Successful Design Process*, pg.32

## Step 4: Determine if a visualization is needed

**Not all data needs to be visualized.** Here are some questions to ask yourself:

1. Can the information be communicated without a visualization?
2. Do you need people to see patterns quickly from the data?



Source: nasa.gov

## Step 5: Cleaning the data

Cleaning data means removing problematic characters, whitespaces, symbols, errors, missing elements and inconsistencies.

Raleigh

Raleigh, NC

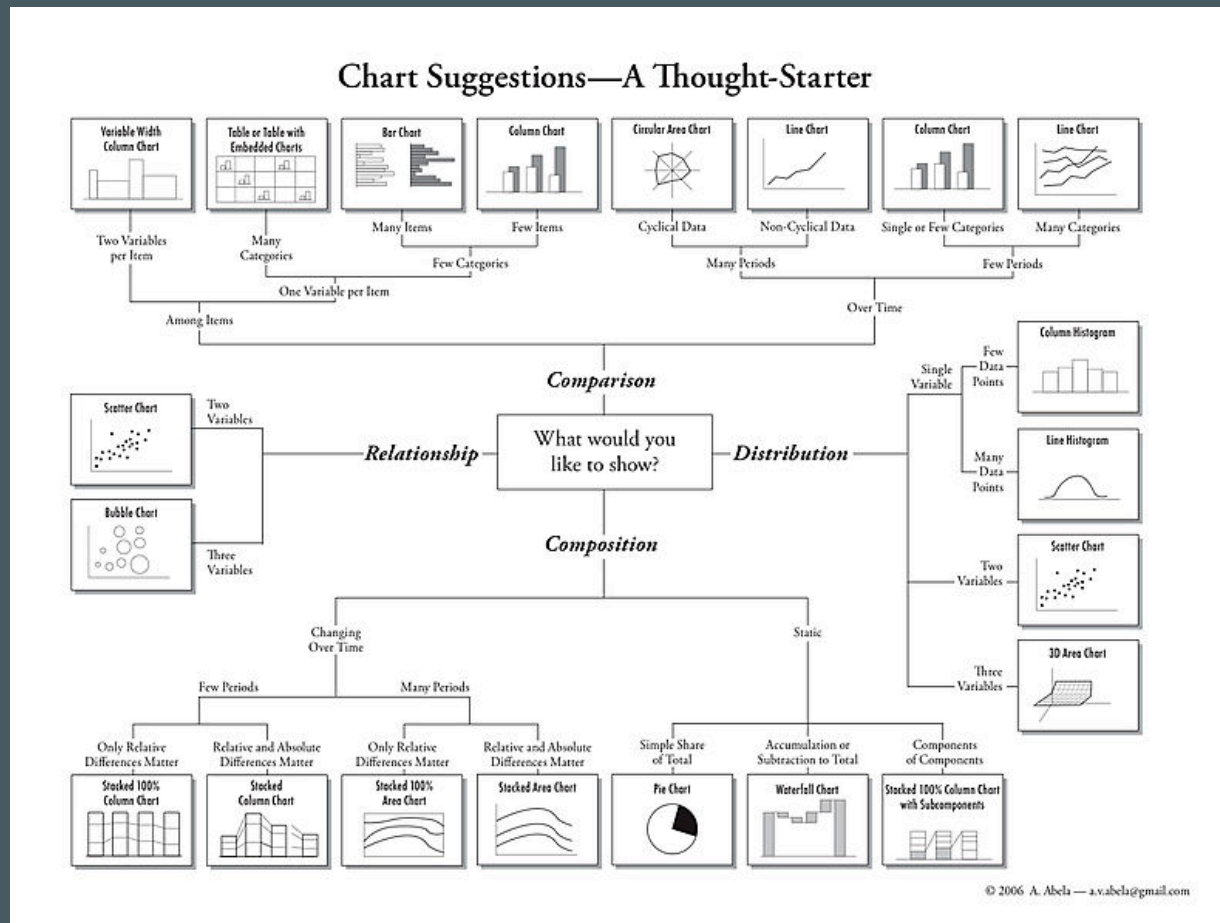
Raleigh, N.C.

Raleigh, NC 27695

Raleigh, NC USA

# Step 6: Visualizing the Data

## Plan the Visualization: Choose chart type!



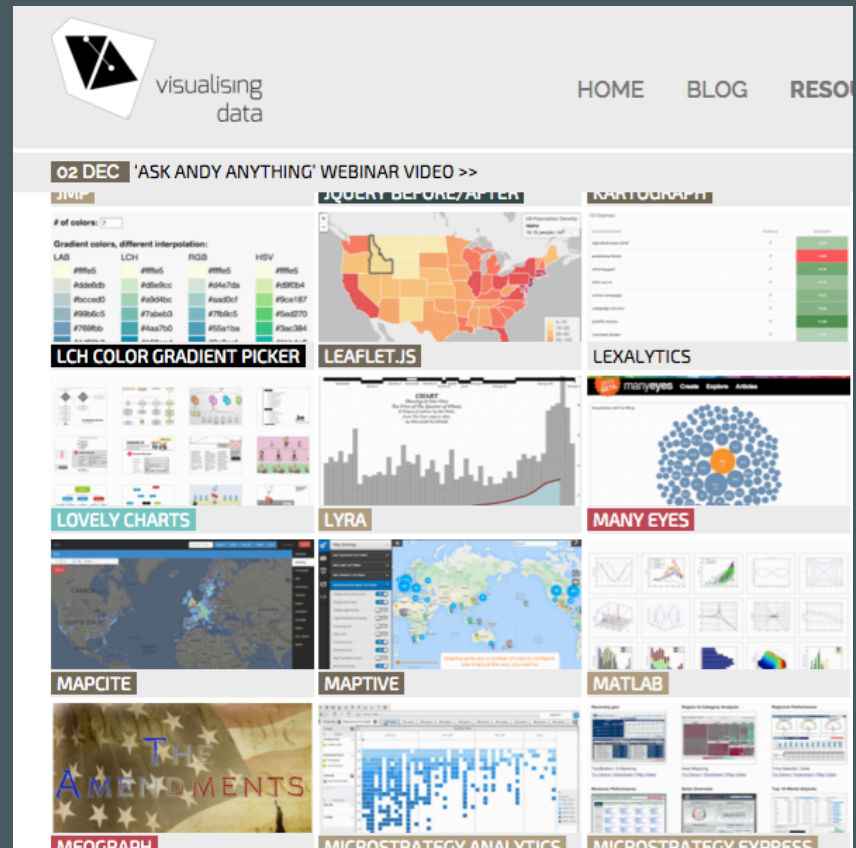
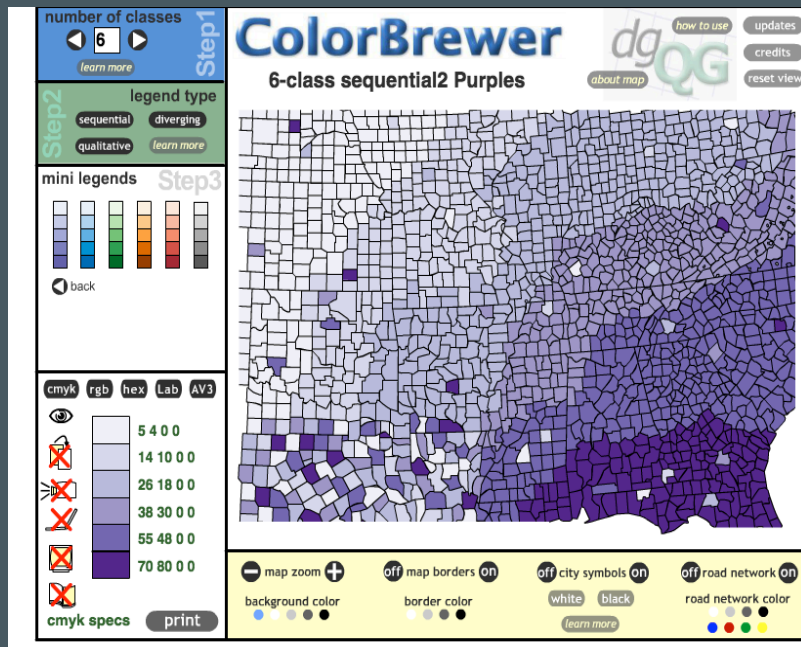
# Additional considerations:

a. Color choice is important.

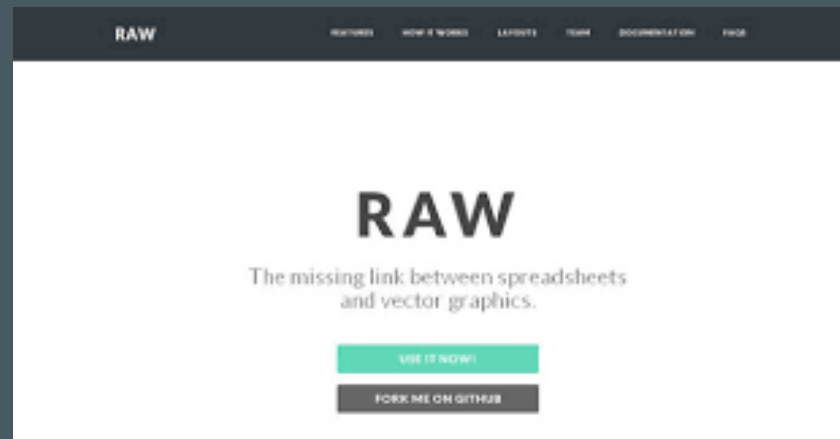
ColorBrewer: [colorbrewer2.org/](http://colorbrewer2.org/)

Visualising Data:

[www.visualisingdata.com/resources](http://www.visualisingdata.com/resources)



# The Tools!



# Tableau [www.tableau.com](http://www.tableau.com)

Interactive data visualization and analytics application

Free and paid versions

**Tableau Public** is free for everyone

**Tableau Desktop** is free for students (

<http://www.tableau.com/academic/students>)

You can create and share graphs, maps, live dashboards

The logo for Tableau Public, featuring the word "tableau" in blue, followed by three small red plus signs, and the word "public" in blue.

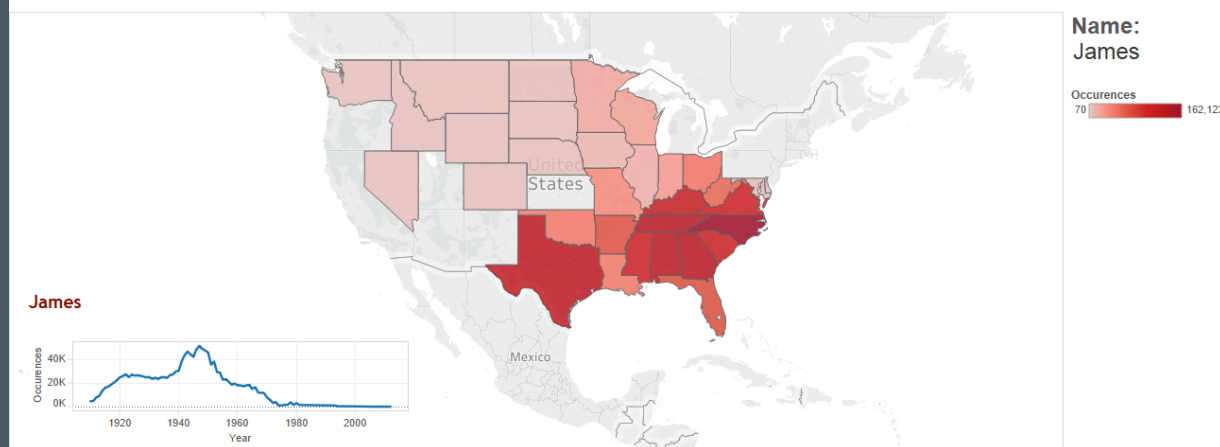
# Tableau examples

## chart types:

- Line
- Bar
- Map
- Flow

## dashboards

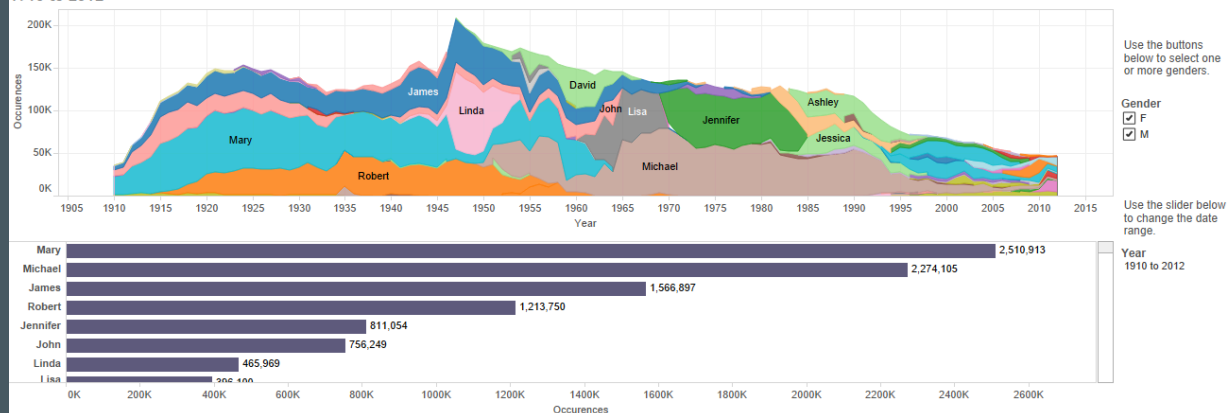
Top Baby Names in the U.S., 1910-2012



From Mary to Sophia: Top U.S. Baby Name Trends Over Time

Baby names in the United States have changed since the early 20th century. Use this dashboard to explore how patterns have changed over time.

1910 to 2012





# How to Use Tableau Public

Go to this website and create your own account:

[public.tableau.com](https://public.tableau.com)

Download and install the application!

Gallery: [public.tableau.com/s/gallery](https://public.tableau.com/s/gallery)

# RAW

[app.raw.densitydesign.org](https://app.raw.densitydesign.org)

Nice exploration tool

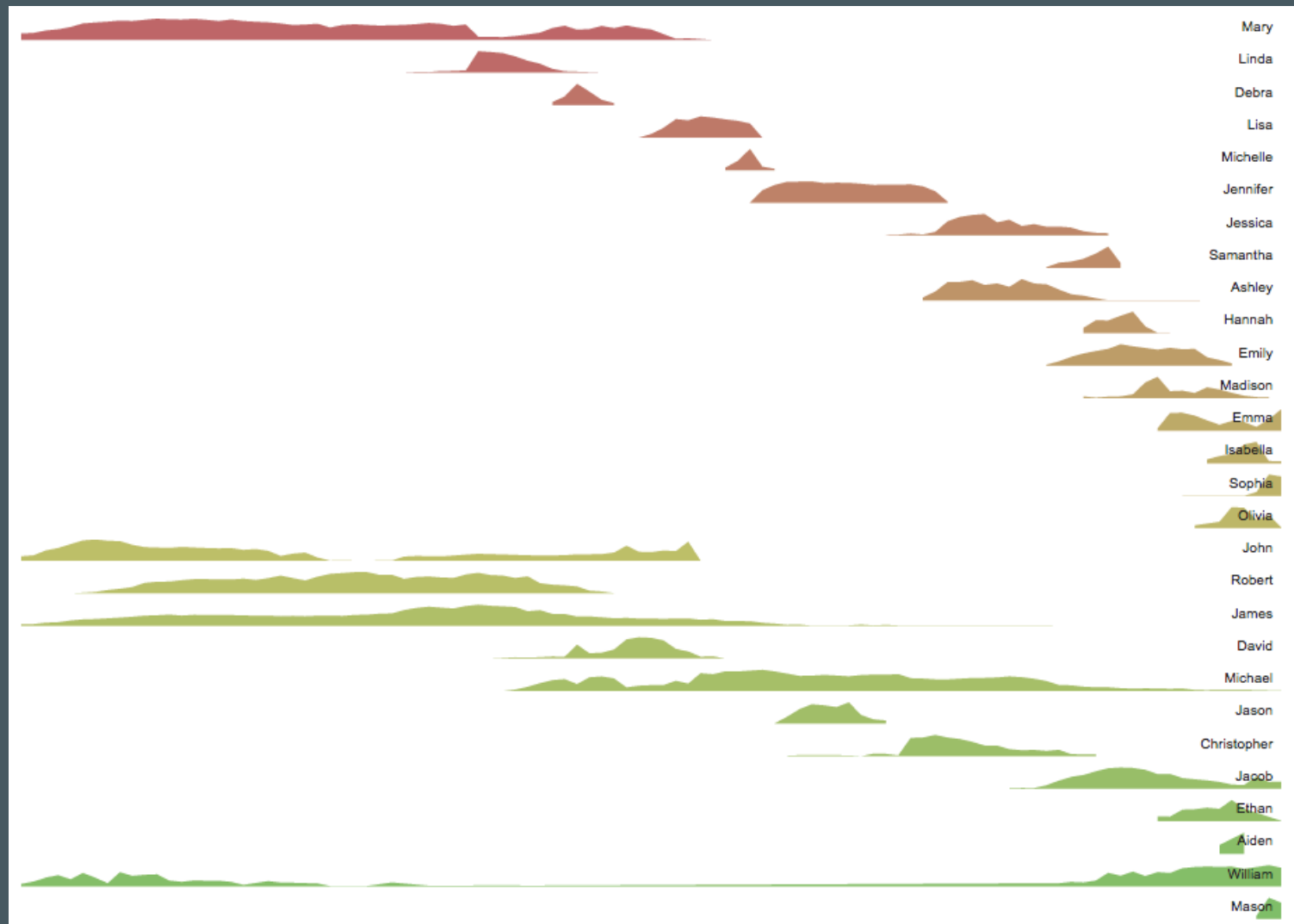
Allows you to make complex chart types

Limited functionality

Data is only in your browser - not stored anywhere

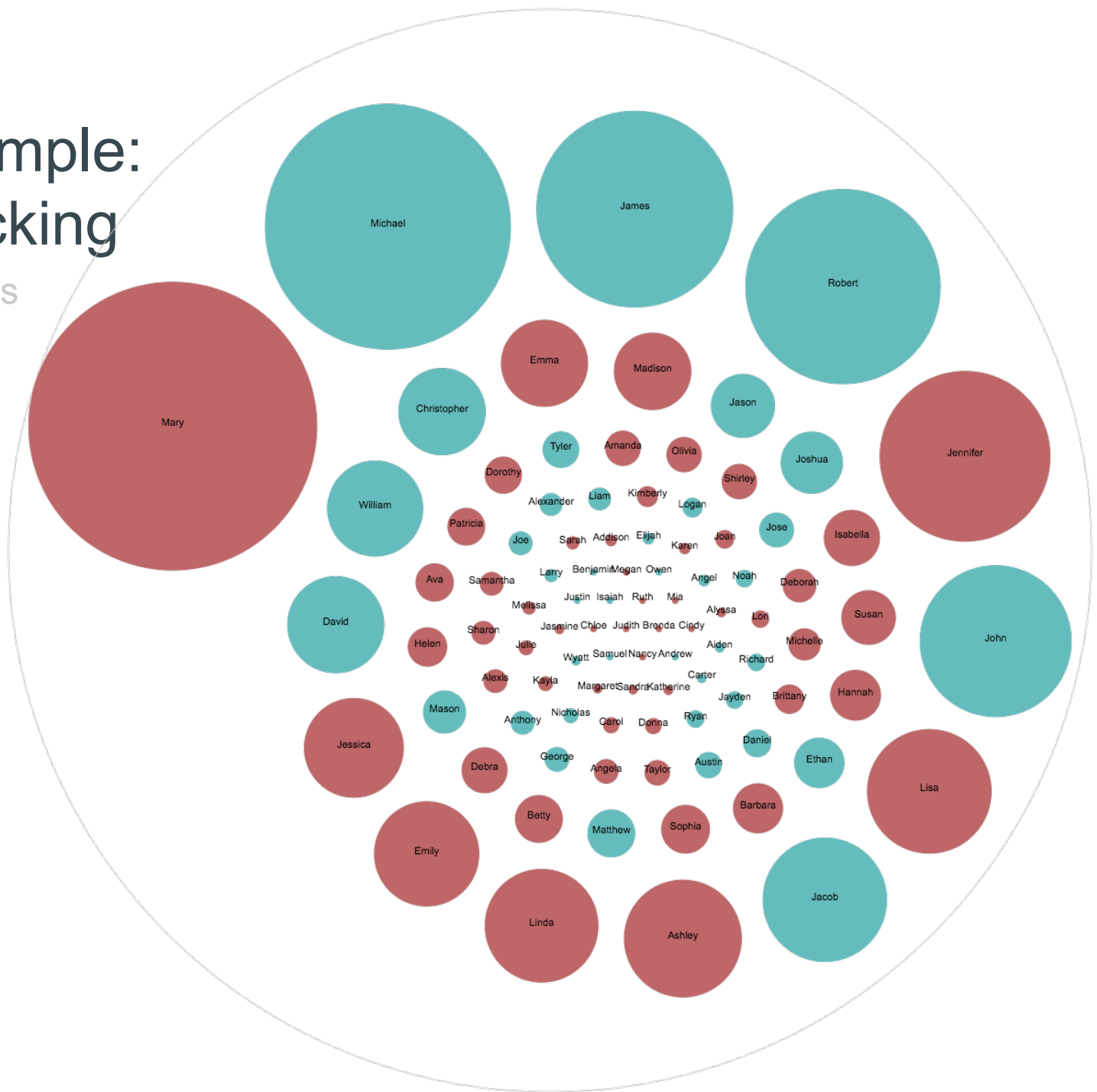
Download: .png, .svg, json

# RAW example: small multiples



# RAW example: Circle packing

Top Baby Names  
in US,  
1910-2012



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